

SENSORY PROFILE AND COLOR STABILITY OF SHEEP SAUSAGES PREPARED WITH OREGANO (*Origanum vulgare*) EXTRACT

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Abstract – The aim of this study was to assess sensory profile and color stability of sheep sausages added with *Origanum vulgare* extract during storage at 20±2 °C for 135 days. Five treatments were prepared: without antioxidant (Control), sodium erythorbate (ER), and three amounts of extract (N1=4964.51 ppm, N2=6630.98 ppm and N3=8038.20 ppm). The trend of the preservative red color (a*) in ER, N2 and N3 treatments, was confirmed from a* and chroma values, agreeing with visual sensory evaluation, in which Control differed in relation to ER ($P<0.05$) and N3 ($P<0.01$). In conclusion, oregano extract showed equivalent effect to sodium erythorbate at intermediate (N2) and high (N3) levels, in relation to color stability, following trend of the sensory profile initially characterized.

Key Words – ovine meat, natural antioxidant, sodium erythorbate.

I. INTRODUCTION

Nowadays, consumers seek to consume increasingly nutritious, healthy, tasty, convenient and safer foods. In this sense, the addition of functional ingredients such as herbs and spices is being studied in association with other technologies to improve the quality of meat and meat products, as well as attribute all the possible benefits to the human organism [1]. During storage of meat and meat products, the maintenance of quality attributes is essential for definition of the purchase by the consumer, being the redness the most relevant visual parameter that directly influences the sensory quality and consequently, the acceptability [2]. Thus, the objective of this study was to evaluate the effects of oregano extract addition on color stability of sheep sausages stored under refrigeration during 135 days, comparing this objective parameter to the sensory profile evaluated at the beginning of storage period, seeking antioxidant properties and health appeal.

II. MATERIALS AND METHODS

The oregano extract was obtained using a solvent mixture of acetone (70%), ultrapure water (28%) and glacial acetic acid (2%) at a ratio of the 1:20 (g/mL) and to each 20 mL of concentrated and lyophilized extract, was performed the resuspension of the samples in 5 mL water [3]. Posteriorly, sausages were prepared using sheep meat cuts of low commercial value. Five different treatments were manufactured: without antioxidant [Control (CO)], sodium erythorbate (ER), and with three different concentrations of oregano extract - N1 (4964.51 ppm), N2 (6630.98 ppm) and N3 (8038.20 ppm), calculated according to Folin-Ciocalteu, DPPH• (2,2-diphenyl-1 picrylhydrazyl) and FRAP (Ferric ion Reducing Antioxidant Power) analyses results, respectively, in respect to the equivalence to 500 ppm of sodium erythorbate. The samples with approximately 18 cm and 150 g were stuffed in natural pork casings (28 to 32 mm), cooked, vacuum packed and stored at 20±2 °C.

The slices were subjected to objective color analysis through the system CIE-L*a*b*, using a portable colorimeter (MiniScan XE, HunterLab, USA) - illuminant D65, observation angle of 10° and open cell of 8 mm. Three readings at different points of the surface were taken after atmospheric exposure [4], being also determined the index of color intensity – chroma [$C^* = (a^{*2} + b^{*2})^{0.5}$] [5]. To the sensory profile evaluation, samples were sliced to a thickness of 0.8 cm, cooked until internal temperature of 72 °C and the tests were conducted right after production (time zero of storage) by fourteen panellists in a randomized block design, subjected to difference from control test to olfactive, gustative and visual evaluation, using a numerical conversion scale: no difference (0), very slight difference (1), slight/moderate difference (2), moderate difference (3), moderate/large difference (4), large difference (5) and very large difference (6) [6]. A total of 30 sausages were analyzed (three samples of each treatment x five treatments x two replicates) at each storage time – zero, 45, 90 and 135 days, and more 30 samples were used to sensory profile. The results were evaluated using SPSS Statistics 17.0 (IBM Corporation, Chicago, IL, USA), and analysis of variance, being

the means compared by Duncan test (5%), except for sensory analysis, which was applied descriptive bilateral Dunnet's test (5%).

III. RESULTS AND DISCUSSION

Color parameters were measured on the surface of the sausage slices along the 135 days of storage and concerning a^* values (red color), it was observed a significant decrease over time ($P<0.05$). This behaviour indicated the gradual discoloration probably caused by metmyoglobin formation, confirmed by the reduction in chroma values (color intensity) ($P<0.01$) [7]. Despite this behaviour (Fig. 1) there was a trend of the preservative effect of the red color in ER, N2 and N3 treatments, although this did not differ significantly at the end of storage ($P<0.05$), agreeing with studies of Fernández-López *et al.* [8], that found lesser trend of degradation of heme pigment also after the cooking process of meat product. In relation to the results for sensory profile at zero time, only the visual test showed significant difference between CO compared to ER ($P<0.05$) and N3 ($P<0.01$) due to differences in appearance noted by the panel, representing, respectively, 25 and 26%. These two samples had more intense red color, which is one of the most important attributes considered at the time of purchase, determining the acceptance by consumers.

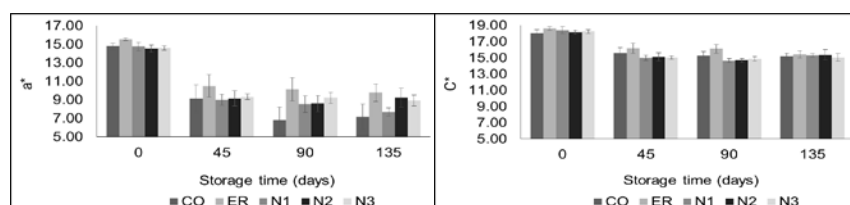


Figure 1. a^* and C^* values during the storage.

IV. CONCLUSION

In conclusion, the sausages containing oregano extract at 6630.98 and 8038.20 ppm, calculated with base in the results of DPPH• and FRAP methods, presented similar results to sodium erythorbate treatment, showed that natural antioxidants can be considered a viable solution to preserve the red color and consequently, the sensory quality with healthiness appeal in cooked meat products.

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